Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Consumer Information and Disclosure	)	CG 09-158
	)	
	)	

COMMENTS OF NEW AMERICA FOUNDATION

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May 26, 2011

I. INTRODUCTION

In response to the Commission's Public Notice for comment on "Need for Speed" information for consumers of broadband services, New America Foundation ("NAF") respectfully submits the following comments, reiterating its support for the Commission to take firm action and adopt consumer information and disclosure rules that empower consumers and promote informed purchasing decisions for broadband services.

As the Public Notice correctly notes, "[m]any consumers…lack information about their connection's performance and its ability to support different services and activities."[1] It thus seeks comment "on the kinds of performance-related information that will be most useful to consumers when they assess which service to purchase." NAF urges the Commission to finally move forward and adopt standardized, comprehensive disclosure rules that ensure consumers have access to fundamental information regarding a broadband service and will allow consumers to compare apples to apples across different broadband providers.[2] In support of that effort, NAF developed a standardized truth in broadband label, based on the related disclosure forms including the "Schumer box" for credit cards and loans, and food nutritional information.[3]

Though we understand the Commission is concerned with finding the most useful

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[1] *Comments Sought on "Need for Speed" Information for Consumers of Broadband Services*, CG Docket No. 09-158 at 2, Public Notice, DA 11-661 (April 11, 2011).

[2] *See* Benjamin Lennett, *et al*, "Broadband Truth in Labeling," New America Foundation's Open Technology Initiative (Sept 23, 2009) *available at* http://newamerica.net/publications/policy/broadband_truth_in_labeling.

[3] *See e.g.* Vicki Needham, "Schumer bill would require banks to clearly display checking fees," The Hill Blog (May 2, 2011) *available at* http://thehill.com/blogs/on-the-money/banking-financial-institutions/158653-schumer-introduces-bill-requiring-banks-to-simplify-the-display-of-checking-account-fees.

way of presenting information given consumers lack of understanding regarding even basic broadband performance metrics such as megabits per second, it should not and cannot let perfect be the enemy of good. The current lack of *any* standardized information on speeds and performance when consumers are deciding upon broadband service is completely untenable, where consumers must make decisions based almost exclusively on marketing slogans that clearly serve the interest of broadband providers that would prefer to not actually compete on the performance capabilities of their services.

Although some consumers may not understand every metric of broadband speeds and performance, they will learn over time. Through crowd-sourcing and other means, Internet users and consumer rating outlets like Consumer Reports will find innovative ways to explain the information to consumers, but only if the Commission requires the disclosures in the first place. NAF, along with a number of public Interest and community groups, have literally filed hundreds of pages of comments and participated in multiple proceedings providing numerous proposals to the Commission in support of consumer information and disclosure rules to provide consumers with access to essential information.[4] If the Commission is serious about encouraging competition and

[4] *See e.g.* Reply Comments of Center for Media Justice, Consumers Federation of America, Consumers Union, Free Press, Media Access Project, National Hispanic Media Conference, New America Foundation, and Public Knowledge, CG Docket Nos. 10-207, 09-158 (filed Feb. 8, 2011); Reply Comments of Consumers Union, CG 10-207, 09-158 (filed Feb. 8, 2011); Comments of Center for Media Justice, Consumers Federation of America, Consumers Union, Free Press, Media Access Project, National Consumers League, National Hispanic Media Conference, and New America Foundation, CG Docket Nos. 10-207, 09-158 (filed Jan. 10, 2011); Comments of Benton Foundation, Columbia Telecommunications Corporation, Consumers Union, Native Public Media, New America Foundation, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36 (filed July 8, 2010); Comments of the Center For Media Justice, Chicago Media Action, Consumers Union, Esperanza Peace and Justice Center, Media Access Project, Media Alliance, Media Justice League, Media Literacy Project, National Alliance for

empowering consumers it must move ahead with standardized consumer information and disclosure rules.

II. THE COMMISSION MUST ADOPT STANDARIZED DISCLOSURE FORMS AND INFORMATION.

The Public Notice asks for the "most important service characteristics that consumers need to consider to determine their broadband performance requirements." The Commission itself has recognized that there is a significant difference between speeds advertised and actual download speeds[5], and that advertised speeds are often "the only performance data available for decision-making when comparing broadband offerings." Given the Commission's finding that actual download speeds lag advertised speeds by roughly 50%[6], as well as the lack of other data for comparison, consumers have essentially no accurate means for comparing service packages, leaving them with only an ISPs marketing to guide their purchasing decisions.[7]

Consequences of this lack of information means that consumers are largely unable

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Media Arts And Culture, National Hispanic Media Coalition, New America Foundation, People's Production House, Public Knowledge, And Reclaim the Media, CG Docket No. 09-158 (filed July 6, 2010); Comments of the Open Internet Coalition, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36 (filed May 4, 2010); Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36 (filed Oct. 13, 2009).

[5] BROADBAND PERFORMANCE: OBI TECHNICAL PAPER NO. 4, FEDERAL COMMUNICATIONS COMMISSION at 12. Note that while the paper recognizes that its metric may not account for all variables affecting performance degradation, it nonetheless concludes that "the 'up to' speed…does not provide an accurate measure of likely end-user broadband experience." *Id*. at 13.

[6] *Id*.

[7] *See* New America Foundation Comments in re *NBP PN #24* (filed December 14, 2009) at 9, Appendix II ("NAF NBP Comments") (noting that "[s]ervice offerings advertisements labeled with the theoretical maximum speed with vague disclaimers such as 'up to' or 'actual speeds may vary,' are completely useless.").

to make comparisons among broadband services before purchasing them and may purchase services that are inadequate to meet their broadband needs. More broadly, the information gap for actual broadband performance means that providers have little incentive to compete on actual speed and thus innovation in the U.S, for higher bandwidth applications and services, and eventually for higher capacity infrastructure, is significantly thwarted.

An effective disclosure must include, at minimum, standardized performance metrics, pricing and cost information, and presentation formats that allow end-users to compare competing service offerings on an apples to apples basis.[8] As NAF and community groups noted in past comments to the Commission, "no two provider websites offer the information in the same format or place, making it even more difficult for consumers to find and compare information and terms of service."[9] NAF believes its aforementioned label to be an effective answer to the Public Notice's request for "the best way to present information regarding broadband performance needs in a concise, cost-effective manner that facilitates informed consumer choice, an it once again submits the label for the Commission's consideration. It is based upon existing disclosure forms for credit cards and loans where regulators were required to "publish model disclosure forms and clauses for common transactions... to aid the borrower or lessee in understanding the transaction by utilizing readily understandable language to simplify the technical nature of the disclosures."[10]

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[8] *See Ex Parte* Notification of Benjamin Lennett, Senior Policy Analyst, New America Foundation's Open Technology Initiative, CG Docket No. 09-158, WT Docket No. 05-194, CC Docket No. 98-170 (filed March 11, 2011), Appendix III ("*NAF Ex Parte*").

[9] Comments of New America Foundation *et al*, CG Docket No. 09-158 (filed July 6, 2010) at 5 ("NAF *et al* Disclosure Comments").

[10] 15 U.S.C. §1604(b).

ExampleCom Ultra 15 Mbps Broadband Truth-in-Labeling	
Advertised Speed	15 Mbps downstream/2 Mbps upstream
Service Guarantees **Services are measured from and to the border router.**	
Minimum Speed at Border Router	8Mbps downstream /384Kbps upstream
Minimum Reliability/Uptime	96%
Maximum Round-trip Latency (Delay) to Border Router	50ms
Service Guarantee Terms	Daily service credit upon request for any outages or extended periods of under-delivery of service
Prices	$44.99 monthly service $19.99 monthly for the first six months on promotion
Service Limits (List all traffic management techniques)	• Exceeding 100GB calendar week considered excessive use, subject to disconnect penalties, see http://www.examplecom.invalid/excessive • Traffic by heavy users in congested areas is artificially slowed, see http://www.examplecom.invalid/shaping
Other Fees (ISPs cannot charge if not listed)	$3 monthly modem rental fee $59.99 installation fee $19 outlet installation $150 early termination during promotion period $2 account change fee $35 service call fee unless $3 monthly inside wiring maintenance plan is in force Sales taxes and franchise fees, vary by location
Contract Term	At will, customer may cancel at anytime after first six months. During the first six months, a cancellation results in a $150 fee.
Service Technology	DOCSIS 1.1 / 2.0 HFC
Legal and Privacy Policies	http://www.examplecom.invalid/legal

Figure 1: NAF's Sample Disclosure Form

NAF's sample disclosure form would require disclosure of broadband speeds, including both the current industry norm of advertised "up to" speeds and a set of service guarantees including a minimum guaranteed speed. As NAF explained in a recent ex parte to the Commission staff, "similar to minimum performance guarantees for uptime and latency standard in service level agreements (SLA's) for commercial business broadband users, the guaranteed minimum speed would be determined by the broadband provider as a floor for what consumers would receive from the service." In addition, "[i]t would provide an incentive for providers to better reflect the capacity and limitations of their broadband technology or network than the current industry standard of 'up to'

speeds." And, "[i]n particular for broadband technologies and networks that rely on high contention ratios in relation to network capacity..." or like wireless mobile where actual speeds are more unpredictable, "the guaranteed minimum would serve as a way for consumers to better assess these limitations without necessarily understanding for example the technological differences between cable modem, DSL, FTTH, WiMAX, HSPA+, LTE and other broadband technologies that can impact the actual performance of a broadband service."[11] The minimum guaranteed speed and maximum latency would be solely determined by the provider and only apply to network links that are within the control of the provider.

In addition to service term guarantees, the standardized disclosures should include details on any traffic management techniques that will effect the performance of the broadband connection and including, but not limited to, any business practices or technical mechanisms employed by the broadband Internet service provider that, other than standard best efforts Internet delivery discriminates against application, content or services based upon the source or protocol, or allocates capacity differently among specific applications, services, or content At minimum, traffic management standard disclosures should include a brief statement of the practice and then include a link to a website where additional information can be found.

Beyond performance information, NAF and public interest commenters have repeatedly urged the Commission to require standardized disclosures with respect to the true cost of services, including all fees associated with a service, and obstacles to ending or transferring service including early termination fees.[12] As NAF and other community

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[11] NAF *Ex Parte* at 2.

[12] NAF *et al* Disclosure Comments at 1.

group noted in previous comments, "essential information on overage charges for specific services is often buried in the fine print of advertisements, if at all. Consumers purchasing or researching wireless services on-line frequently must scour a provider's website to be aware fully of all the potential charges they could incur, including overage charges and early termination fees (ETFs)."[13]

A disclosure with each of these components would benefit consumers, and would also prove invaluable information to consumer rating organizations and businesses such as Consumer Reports. Indeed, the Commission could set off an entire new industry for rating broadband services, which could use the resulting data to provide comprehensive analysis in the form of tools and resources by which consumers, application developers, and other market participants to determine what services are best utilized to meet their respective needs.[14] Moreover, applications developers could begin to advertise minimum requirements for their applications based on the information disclosures, further driving consumer education and awareness, while also increasing demand for innovative, faster broadband networks.

III. THE COMMISSION'S DISCLOSURE REQUIREMENTS SHOULD BE MANDATORY

The Commission should adopt disclosure rules and cannot rely on a voluntary code of conduct. Despite the Commission's focus and even the widespread public outcry over bill shock and other consumers harms, most providers have largely demonstrated, there unwillingness to provide consumers with accurate information regarding the performance, price, and terms of use for their broadband services. Voluntary

[13] *Id*. at 5.

[14] *See* NAF *Ex Parte* at 2.

commitments to the FCC without accountability (regardless of service provider or context) have historically presented a poor track record for their ability to protect consumers, particularly when those commitments are intended to avoid regulation.[15]

In response to arguments about the feasibility or cost of disclosures, NAF points to Sascha Meinrath's testimony before the Commission on January 19, 2010 where he stated, "Let me be clear – almost all of the useful information that we would like to see made public *is already being collected by system administrators and ISPs*."[16] Meinrath further explains that "the problem is not how to collect information that would be useful to consumers, but why successful public data collection practices stopped in the first place."[17] Indeed, a level of disclosure similar to the one NAF proposes is already offered to business customers, and generally includes such information as service level agreements and other guarantees.[18]

III. CONCLUSION

For the aforementioned reasons, NAF asks the Commission to promptly adopt rules for mandatory and standardized disclosures and consider NAF's sample form as a model for a concise and useful presentation form for comparing broadband services.

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[15] See Comments of Consumer Federation of America *et al*, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36 (October 13, 2009).

[16] Testimony of Sascha Meinrath on behalf of New America Foundation's Open Technology Initiative before the Federal Communications Commission (Jan. 19, 2010) at 3 Appendix IV ("Meinrath Testimony").

[17] *Id.*

[18] *Id.* at 3.

Respectfully Submitted,

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Appendix

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
International Comparison and Consumer	)	
Survey Requirements in the Broadband	)	GN Docket No. 09-47
Data Improvement Act	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
Inquiry Concerning the Development of Advanced	)	
Telecommunications Capability to All Americans in a	)	
Reasonable and Timely Fashion and Possible Steps to	)	GN Docket No. 09-137
Accelerate Such Deployment Pursuant to section 706	)	
of the Telecommunications Act.	)	

COMMENTS OF THE NEW AMERICA FOUNDATION – NBP PUBLIC NOTICE #24

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SUMMARY

In the present *Notice*, the Federal Communications Commission (FCC or Commission) seeks comment on empowering consumers by ensuring sufficient access to relevant information about fixed residential and small business Internet broadband services. The Commission further seeks comment on measuring, tracking, and reporting service quality of fixed services.

The New America Foundation's Open Technology Initiative (NAF) commends the Commission for this *Notice* and the commitment to empowering consumers and promote transparency in broadband services. NAF believes that existing rules to ensure consumers' access to relevant information about the communication services they are purchasing are grossly insufficient. Voluntary guidelines are insufficient as a substitute for codified regulations, as service providers routinely fail to disclose meaningful information to consumers. Substantial changes to the Commission's existing rules are necessary to remedy these problems and empower consumers with the information they need to make an informed choice of their Internet service provider (ISP) and offering. However the problem goes beyond just the challenges faced by consumers; policymakers, researchers, and innovators have access to too little information about the workings of the Internet. Access to raw data on Internet traffic and performance has substantially diminished as scientists have struggled to conduct network research under ever-increasing constraints.

To remedy these problems, NAF provides the Commission with several policy recommendations including:

- Clear disclosure rules to ensure consumer have access to fundamental information about broadband service offerings.
- Standardized information disclosures across all fixed and mobile broadband services.
- Require advertisements to provide clear expectations of the service offering including the typical capabilities and the actual price of the service, not theoretical maximums.
- Require providers to inform consumers of the FCC complaint process.
- Allow consumers to append test results from measurement tools to complaints filed with the FCC and release complaint data on each provider.
- An FCC led effort to measure and collect fundamental data on broadband service capabilities and Internet performance and traffic statistics.

In addition, these comments provide an overview of both active and passive measurement systems. We encourage the Commission to think broadly about measurements and data collection. The FCC should promote efforts that will empower consumers and the Commission assess the capabilities of broadband services and create viable sources for data on Internet traffic and network performance for researchers and policymakers. Important to the success of these efforts, the FCC should focus on openness and transparency in its measurement process and ensuring access to raw data by the public, researchers and policymakers.

TABLE OF CONTENTS

I. INTRODUCTION: TRANSPARENCY AND MEASUREMENT OF BROADBAND SERVICES IS VITAL TO THE NATIONAL BROADBAND PLAN AND THE PUBLIC INTEREST

The New America Foundation's Open Technology Initiative (NAF) respectfully submits these comments in response to the Commission's *Public Notice #24* in the above-captioned docket.[1] In the *Notice*, the Commission seeks comment on empowering consumers by ensuring sufficient access to relevant information about fixed residential and small business internet broadband services. The Commission further seeks comment on measuring, tracking, and reporting service quality of fixed services.

NAF commends the Commission for this *Notice* and its commitment to promoting transparency in broadband services. NAF believes that existing rules to ensure consumer's access to relevant information about the communication services they are purchasing are grossly insufficient. Service providers overpromise on the capabilities of their service and routinely fail to disclose limitations to services and hidden fees. This leads to substantial consumer confusion and frustration when choosing among service providers and plans, assessing the actual speeds and quality of a broadband service, and the actual cost of a service. Consumers have limited or no access to a wide range of service aspects, including typical service prices, usage limits and fees, actual performance and imposed limitations, and other contract terms. Voluntary guidelines are not proving sufficient as a substitute for codified regulations, as service providers routinely fail to disclose meaningful information and hide the information they do disclose in fine print below misleading "base rates" and "advertised speeds." Substantial changes to the Commission's existing rules are necessary to remedy these problems. The Commission has clear authority and statutory obligations to strengthen current information disclosure policies, and must act upon these authorities.[2]

These challenges are faced not just by consumers, by also by policymakers, researchers, and innovators who access to little information about the workings of the Internet. Such an information void did not always exist. NSFNET, which served as the precursor backbone to the commercial Internet, collected and made publicly available fundamental performance statistics from 1988 to 1995. Since that time, access to raw data on Internet traffic, topology, routing, and security have diminished, causing Internet researchers have struggled to conduct legitimate and reproducible experiments.[3] Thus, it is important not only for the Commission to bring transparency to consumers, but to pursue efforts to provide access to fundamental information on broadband connections and Internet performance.

The benefits of a focused FCC effort for Internet services are three fold:

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[1] *Broadband Measurement and Consumer Transparency of Fixed Residential and Small Business Services in the United States*; GN Docket Nos. 09-47; GN Docket Nos. 09-51; GN Docket Nos. 09-137; Notice of Inquiry, (rel. November 24, 2009) ("*Notice").*

[2] *See* para. 5, *Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge*, CG Docket No. 09-158; CC Docket No. 97-170; WC Docket No. 04-36; available at http://fjallfoss.fcc.gov/ecfs/document/view?id=7020141629..

[3] *See* Meinrath, Sascha D. and claffy, kc; *The COMMONS Initiative: Cooperative Measurement and Modeling of Open Networked Systems,* 418; Appendix 1.

- ***Empowering Consumers and Promoting Competition***

As the Commission correctly concluded, "the proper functioning of competitive markets is predicated on consumers having access to accurate, meaningful information in a format that they can understand."[4] Just as the Food and Drug Administration requires food manufacturers to appropriately label products with a list of ingredients and the nutritional information,[5] consumers should be afforded a similar understanding of their broadband offering. In an effort to develop a similar proposal, NAF developed a Truth-in-Labeling disclosure form.[6] A standard form allowing consumer to compare apples to apples among providers is essential to promoting competition in broadband services.

- ***Spurring Research and Innovation***

Obstacles to the collection and analysis of Internet traffic and performance data since the transition to the commercial Internet pose not only formidable technical and engineering challenges, but more daunting legal, logistical, and proprietary considerations. In combination, these issues have left the Internet research community continually struggling to validate research that fosters new network innovations. A FCC-led effort to collect measurements of broadband networks offers an unprecedented opportunity to provide rigorous empirical data against which to validate theory, modeling, and support for scientific research, development of new measurement technology and evaluation of proposed future Internet architectures.[7]

- ***Improving Public Policy***

As the Commission examines complex issues of network congestion and network management, it is entirely dependent on analyses of traffic and usage data from service providers. Given the increasingly critical role of information and communications technologies for national productivity, economic competitiveness, and even security, the costs of policy errors could be grievous. Yet decision makers are often forced to operate in an information vacuum—being placed in the position of only having access to the information that the companies which would be affected by policy and regulatory changes are willing to share.[8] Data that is publicly accessible, and independently verifiable would support public analysis of actual Internet traffic, to inform salient debates on technical, economic, policy, privacy, and social issues relating to the Internet – many of which have been shrouded in secrecy. The data derived from a systemic collection of end-user data and Internet performance and traffic statistics would provide expert agencies with access to vital independent research and analysis.[9]

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[4] *Second Truth-in-Billing Order* at para. 3.
[5] *See, e.g.*, Nutrition Labeling and Education Act of 1990, Pub. L. No. 101-535, 104 Stat. 2353 (codified as amended in scattered sections of 21 U.S.C.). *See also* Food Labeling Guide, U.S. Food and Drug Administration, http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/default.htm (last visited Nov. 4, 2009).
[6] *See* Open Technology Initiative, *Broadband-Trut-in-Labeling*; Appendix 2.
[7] *See The COMMONS Initiative*; Appendix 1.
[8] *Id. See also* Meinrath, Sascha D., *Analyzing in the Dark: The Internet Research Data Acquisition Crisis*, Appendix 6.
[9] *See The COMMONS Initiative*, Appendix 1.

NAF proposes a number of detailed policy recommendations and ideas to the Commission. No matter what specific rules the Commission decides upon, NAF believes the following principles and policies are essential to promoting broadband transparency and measurement:

Consumer Transparency

- *Provider information and disclosures should be prominently displayed, easily accessible and standardized across all fixed and mobile broadband services.*
- *Vital information on broadband service offerings should be available upfront, before the consumer purchases the service.*
- *Prices should reflect the actual price of the service, including but not limited to, the non-promotional price, along with any installation, necessary equipment, taxes and other fees.*
- *Advertisements should provide clear expectations of the service offering including the typical capabilities, not theoretical maximums, and the actual price of the service.*
- *Existing customers should receive advance and explicit notification on any changes to the technical capabilities, terms of service (TOS) or use, privacy policy, network, management practices, and any other changes to the service.*
- *Users should be able to report inconsistencies and file complaints to the FCC if the actual capabilities of their service differ from the capabilities indicated by their service offerings.*
- *Aggregate statistics of those complaints should be publicly available, including the number of complaints and reasons for complaints, per provider.*

Measurement Transparency

- *Sustained FCC-led effort to measure and collect fundamental data on broadband service capabilities and Internet performance and traffic statistics.*
- *Measurement tools should be open source, with an open API, to allow for independent verification of test methodologies and maximum extensibility.*
- *Measurement data, subject to privacy considerations, should be open and publicly accessible.*

II. CONSUMER TRANSPARENCY REGARDING FIXED SERVICES

For a consumer to (1) choose a provider, (2) choose a service plan, (3) manage the use of the service plan, and (4) decide whether and when to switch to an existing provider of the plan, they need to know not only the information that affects the reliability of their use of the service and applications over the service, but have this information easily available and comparable between providers, services, and offers. Consumers need data on four critical aspects of their service: cost of the service, technical capabilities, terms of the service, and the limitations of the service.

Clear disclosure rules are needed to ensure consumer have access to the following:

- Actual service costs, including disclosure of mandatory line-item charges, non-promotional rates, and one-time and recurring fees;
- Limits on usage, as well as standardized and meaningful representations of overage fees;
- Actual, expected speeds of Internet access services in times of peak and non-peak usage, not just theoretical maximums;
- Meaningful information about restrictions and provider rights asserted in the terms of service;
- Meaningful information about actions conducted by providers that monitor, manage or interfere with a subscriber's use of services or Internet traffic; and
- Obstacles to ending or changing service, and their purpose for being imposed, including in early termination fees and device locking mechanisms.[10]

NAF has created a sample Broadband Truth-in-Labeling disclosure, which is detailed below.[11] The intent of the disclosure form is to require ISPs to use a standardized label to inform potential and existing customers about the broadband services they are subscribing to, including technical capabilities, service guaranteed, prices, service limits, and other related elements. The labels aim is to educate customers, make broadband services more transparent, and to spur broadband competition, innovation and consumer welfare. The Broadband Truth-in-Labeling disclosure should be standardized to comprise several typical elements as indicators of broadband service quality, such as minimum expected speed and latency to the ISP's border router (where the ISP connects to the rest of the Internet) and service uptime. These minimum assurances will be supported by the ISP as guarantees in the delivery of broadband services, backed by technical support and service charge refunds or credits. In addition to the description of minimum guarantees of the service, the disclosure should include all applicable fees, a common description of the technology used to provide the services, any service limits such as a bandwidth caps or the application of any traffic management techniques, the length of the contract terms, and specific links to all additional terms and conditions. Requirements should be established for disclosing any highly objectionable or surprising terms such as arbitration restrictions or customer data-selling.

When considering disclosure rules, it is critical for the Commission to recognize the importance of disclosing information that may be currently beyond the understanding of the average consumer. Although some providers would prefer to oversimplify the consumer purchase or comparison of broadband services to simple advertising slogans and "up to" speed consideration, it is important to the public interest that consumers have every opportunity to truly understand a broadband service. For example, although the average consumer currently may have little understanding of the importance or impact of latency on their on-line experience, it does not follow that they will never understand. Rather, just as when the PC was relatively new, most consumers had little recognition of technical considerations such as processor speeds, RAM, or hard disk space, they have become increasingly important to consumers purchasing

[10] *See* p. 21, *Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge*, CG Docket No. 09-158; CC Docket No. 97-170; WC Docket No. 04-36; available at http://fjallfoss.fcc.gov/ecfs/document/view?id=7020141629.
[11] *See Truth-in-Labeling*; Appendix 2.

decisions of PCs as well as software, which often provide consumers with the necessary system requirements before purchase.

In the same way, more advanced technical information and statistics about broadband service offerings will become increasingly relevant to consumers over time. Similar to software companies, application and content developers could provide consumers with the necessary broadband requirements for proper performance. This would help to maximize consumer utility for broadband and allow purchasing decisions to be influenced by performance characteristics relevant to the applications and content consumers demand. In addition, requiring the public disclosure of even complex information would allow for interested individuals and entities to crowd-source the information and improve the ability of consumer groups and publications to develop guides and comparisons. Currently, such organizations have scant information to develop comparisons of broadband plans or providers, often relying on sporadic reviews or speed-tests from ISP customers. The possibilities are endless for the types of information that could be crowd-sourced and reformulated to improve consumer welfare as result of greater transparency.

1. Information to Potential New Customers

As the Commission noted, "To choose a provider, consumers need information on the availability and quality of network services and related equipment (coverage and reliability), various provider fees for similar services, and full disclosure of the contractual commitments they are undertaking. To choose a service, they need to be able to compare and contrast service plans offered by different providers and assess the full costs of each option. To use a service plan well, they need accurate and transparent billing statements, clear usage information, and accurate disclosures about changes in fees or terms of service during the relevant period."[12]

Internet Access Providers should disclose the important facts and details of the broadband offering before consumers purchase service. Providing clear, meaningful, comparable disclosures ultimately spurs competition between ISPs and encourages the future development of new broadband technologies. NAF has already developed an example Truth-in-Labeling standard. Drawn from similar useful disclosure requirements by lenders, these Broadband Truth-in-Labeling disclosure standards could give the marketplace a much-needed tool that clarifies and adds meaning to the terms and conditions of the service being offered.[13] Based on the "Schumer Box" required for loan applications, this standardized format could be used to display the price, features, and limitations of a service offering on a provider's website. This type of display must be included in the initial presentation of a service offering. If a comparable format of service details is not available until a consumer purchases the service, the consumer's ability to compare services or providers is greatly diminished as the consumer must initiate purchase of multiple offerings in order to compare. This Broadband Truth-in-Labeling disclosure must be shown to the consumer as part of the sign-up process and must be assertively presented again any time the ISP decide to alter the terms in such a way that alters the facts on the original Broadband Truth-

[12] *See* ¶ 23, *Customer Information and Disclosure Truth-in-Billing and Billing Format IP-Enabled Services,* CG Docket No. 09-158; CC Docket 98-170; WC Docket No. 04-36, Notice of Inquiry, FCC 09-68 (rel. 28,2009) ("Notice").

[13] *See Broadband Truth-in-Labeling*; Appendix 2.

in-Labeling disclosure. In addition, to the greatest extent possible, these disclosures should be as geographically specific as possible for providers with a national footprint.

Figure 1: NAF Broadband Truth-in-Labeling Form

ExampleCom Ultra 15 Mbps Broadband Truth-in-Labeling	
Advertised Speed	15 Mbps downstream/2 Mbps upstream
Service Guarantees Services are measured from and to the border router.	
Minimum Speed at Border Router	8Mbps downstream /384Kbps upstream
Minimum Reliability/Uptime	96%
Maximum Round-trip Latency (Delay) to Border Router	50ms
Service Guarantee Terms	Daily service credit upon request for any outages or extended periods of under-delivery of service
Prices	$44.99 monthly service $19.99 monthly for the first six months on promotion
Service Limits (List all traffic management techniques)	• Exceeding 100GB calendar week considered excessive use, subject to disconnect penalties, see http://www.examplecom.invalid/excessive • Traffic by heavy users in congested areas is artificially slowed, see http://www.examplecom.invalid/shaping
Other Fees (ISPs cannot charge if not listed)	$3 monthly modem rental fee $59.99 installation fee $19 outlet installation $150 early termination during promotion period $2 account change fee $35 service call fee unless $3 monthly inside wiring maintenance plan is in force Sales taxes and franchise fees, vary by location
Contract Term	At will, customer may cancel at anytime after first six months. During the first six months, a cancellation results in a $150 fee.
Service Technology	DOCSIS 1.1 / 2.0 HFC
Legal and Privacy Policies	http://www.examplecom.invalid/legal

a. Vital Information

Technical capabilities

The speed and actual capabilities of broadband service offerings should be a source of competition between services and providers; but in order to be meaningfully comparable, the capabilities represented must reflect the actual performance of the service. Service offering advertisements labeled with the theoretical maximum speed with vague disclaimers such as "up to" or "actual speeds may vary," are completely useless. As the Commission correctly noted the "[m]aximum advertised speed is often cited, but the actual is more useful" particularly since the difference between the median actual speed is often 50% slower than advertised.[14] Consumers must have legitimate information as to the speed of a service offering in order to decide when to switch to a new service or provider. NAF believes a solution to this issue is to require providers to disclose a minimum speed guarantee from a subscriber's connection to a border router or edge

[14] Commission Open Meeting Presentation on the Status of the Commission's Process for Development of a National Broadband Plan, Sept. 29, 2009, Slide 26.

of a provider's network. The minimum guaranteed speed would be determined by the provider and include a measure of reliability. These minimum assurances should be supported by the ISP as guarantees in the delivery of broadband services, backed by service charge refunds or credits if they are not delivered. Such a metric would provide much more useful statistic than the current industry norm of utilizing theoretical maximums, which can vary depending upon location of service, type of day, etc. In addition, other technical characteristics such as latency, a performance characteristic increasingly important for consumers using real-time, two-way communication, should further disclosed.

Service costs

Consumers should know the actual cost of a broadband service. Service advertisements often only present a promotional price for the service whereas the monthly bill will include various fees, surcharges, mandatory bundles, and a monthly rate, which increases after the promotional period ends. These hidden costs obstruct a consumer's ability to accurately compare services and challenge the ability to make informed decisions about switching services. For example, a Verizon mailing advertises a contractual, promotional monthly rate of $19.99 for DSL service, a price that does not include "taxes and fees" or a one-time charge of "up to $55".[15] In order to receive the promotional rate, a customer must also purchase telephone service and after the first six months, the service will increase 60%. Further, if the customer leaves before the contract is up, they will be assess a $79 early termination fee. Verizon also retains the right to increase the cost of the Internet service if a customer cancels the accompanying telephone service.[16]

Early termination fees (ETF) are nearly ubiquitous across all broadband services and are a limitation for users switching services. ETFs are an additional cost burden to switching services on top of any one-time fees a user may be charged when starting a new service. Since they inherently must be taken into account by a consumer when considering changing their service, these charges must be disclosed up front. Similarly complex billing practices need to be disclosed upfront, encompassing the actual monthly costs of a service plan so that a consumer can make an informed decision regarding the costs of different plans. Upfront disclosure to consumers should further include the non-promotional price, along with any and all other fees for the service.

Terms of service

Limited disclosure of terms of service pertaining to Internet services can affect a user's experience on the Internet. As such, this information should be readily accessible, and easily comparable between services and providers. Terms of service for service offerings are often hidden in legal verbiage, small text size, or non-prominent placement compared to other aspects of the service offering.[17] Sometimes, extremely relevant information to the experience of the service, such as a universal declaration that a customer's Internet usage can be monitored or

[15] *See* Appendix 3, Exhibit A.
[16] *See Verizon Online Terms of Service*; Appendix 4, Exhibit A.
[17] As noted in *Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge*.

interfered with, can be hidden in the terms of service. For example, Comcast "reserves the right to refuse to transmit or post, and to remove or block, any information or materials" it deems in violation of the acceptable use policy.[18] One network use subject to termination is the distribution of "derivative works...without obtaining any required permission of the owner."[19] Further, Comcast, Quest, and Verizon specify that they may immediately suspend or terminate service if any terms of the Acceptable Use Policy are violated.[20] The privacy practices of the provider are important to be disclosed with the service offering. Consumers need to be informed as to what information about them, and their Internet usage, will be collected through their purchase of the service and what opportunities they have to opt out. For example, Comcast's legal policies reveal that they monitor bandwidth, usage, transmissions, and content.[21] Such practices need to be clearly disclosed to a potential customer.

Limitations

Consumers need to know any limitations that may be applied to the service offering including usage caps, and subsequent overage charges, as well as traffic or network management practices that can influence how a consumer will be able to utilize and interact with the service. If a service offering has a cap on how much data can be consumed within a given period, this must be clear and disclosed up front, along with any fees associated with exceeding the cap. Cap and overage charges must be referenced clearly with any presentation of price (e.g."$40 a month for the first 5GB, $.05 per additional MB.") Any traffic management which may affect a consumer's usage or experience of the service or an application must also not only be disclosed, but this information must be easily accessible before purchase. For example, if the use of certain applications or exceeding a certain amount of bandwidth consumption will result in a lower prioritization of traffic or a different experience of the service, these types of limitations must be disclosed as part of the service offering. With the exception of Comcast, which was compelled to disclose their practices by the FCC,[22] the majority of ISPs have provided relatively little information regarding their network management practices and the capacity limitations of their broadband networks.[23] Even so, in their Acceptable Use Policy, Comcast only offer that they may lower "the priority of traffic for users who are the top contributors to current network congestion."[24] Both consumers and developers would benefit from a *full* disclosure of network management practices with a clear explanation of how the system works. Sufficient disclosure of the network management tools used by ISPs is critical to the designers of Internet applications, as it allows them to predict whether their application will mesh with a given network.[25]

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[18] *See Comcast Acceptable Use Policy*; Appendix 4, Exhibit B.
[19] *Id.*
[20] *Id., Quest Acceptable Use Policy;* Appendix 4 Exhibit C, and *Verizon Acceptable Use Policy*; Appendix 4 Exhibit D.
[21] *See Comcast Acceptable Use Policy*; Appendix 4, Exhibit B.
[22] *See In re Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* Memorandum Opinion and Order, WC Docket 07-52, ¶ 32 (Aug. 20, 2008), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-183A1.pdf [hereinafter In re Broadband Industry Practices.
[23] *Id., supra* note 2, at 58 (Comm'r. Tate, dissenting)
[24] *See Comcast Acceptable Use Policy*; Appendix 4, Exhibit B.
[25] *See In re* Broadband Industry Practices, *supra* note 2, app. at 46.

Quality of Service Information

In addition, potential customers would benefit from access to quality of service information on a quarterly or annual basis. Quality of service information could consist of performance and customer service statistics such as average speeds up/down, average latency, jitter, dropped packets, uptime, service outages, and customer equipment failures. Providers should be required to disclose the above quality of service information to consumers on the provider's website.

b. Details in Advertisements

We recognize to a certain extent that the above disclosures and disclosure format may need to vary by advertising format, i.e. television, radio, online, mail, etc. Advertising to consumers needs to provide truthful claims to consumers regarding service offerings. The most vital stats for advertisements are the typical capabilities of a service and the actual cost of service in both print or online and television or radio advertising. For short television or radio advertising spots, providers should clearly indicate that that any "up to" speeds will substantially vary and are not guaranteed. The Commission could also require that providers disclose some measure of actual or typical speeds with a measure of reliability. Alternatively, the minimum guaranteed speed utilized by NAF's Broadband Truth-in-Labeling could be required in the advertisement. Actual prices for services should also be indicated in the ads, including non-promotional pricing, and other fees, along with any usage limits, overage charges, and early-termination fees. Similar requirements should be included for online or mailing advertisements, in easily readable formats and a clear indication of where to view all disclosures about the service – more than simply directing consumer to the provider's website

c. Details at Point of Sale

The point of sale, whether it is a provider's website, over the phone, or any physical sales offices, is the most critical point of disclosure. Providers must be required to disclose any and all information necessary for the consumer to make an informed purchasing decision. Any standardized disclosure forms, such as NAF's Broadband Truth-in-Labeling form, should be prominently displayed on the provider's website before purchase, along with clear links to the complete list of terms of service, fees and limitations. For phone orders, consumers should be provided with same information as available on a provider's website. Paper copies should be provided at any sales offices.

2. Information to Existing Customers

a. Explicit and Clear Communication to Consumers of Any Changes to the Service

Customers must be informed with adequate advance time to any change to terms of service, limitations, or technical capabilities of the service. For example, Comcast makes "reasonable efforts to make customers aware of any changes" to their Acceptable Use Policy, but examples of "reasonable efforts" given are "emailing the customer or posting information on the

Comcast.net website.[26] At a minimum providers, should disclose any of these changes with the bill, either paper or via electronic delivery, if a consumer has opted for that method. The disclosure would explicitly state what about the service has changed, and not require the subscriber to comb through the terms of service or acceptable use policy to determine the changes.

b. Subscriber Tools to Measure Usage

Subscribers should further have access to tracking tools, such as a means to monitor, usage or consumption. As providers have increasingly expressed interest in or implemented usage or bandwidth caps, they have not committed to providing consumers with the necessary information to ensure compliance. Although, companies such as Comcast have offered it would provide subscribers with a tool to monitor their monthly broadband usage, to date suchs tool are still unavailable to subscribers. Over a year after announcing a 250 GB monthly usage cap on subscribers, Comcast has only recently released a "data usage meter" in a pilot program in the Portland, Oregon Area.[27] Even so, it only accounts for a consumer's monthly usage, and provides no means for subscribers to measure their usage in real-time – a significant problem given Comcast's network management system.[28] According to their January 2009 filing with FCC, Comcast's "Fair Share" system de-prioritizes a user's traffic when they exceed 70 percent of their upstream or downstream bandwidth over a fifteen-minute when the network is "Extended High Consumption State."[29] However, Comcast provides the consumer with no means to track their bandwidth consumption, nor is the customer informed that their traffic is being de-prioritized. Such a tool would help consumers understand why a particular application is not working and minimize user frustration. Particularly, given that many of the caps may result substantial overage charges, providers must be required to supply their users with a means to monitor their usage – as they have considerable financial incentives to encourage users to exceed those caps.

3. Complaint Procedures

The current process for reporting service and billing issues with the FCC is insufficient. As the Commission is well aware, a Government Accountability Office survey suggests that many consumers do not know they can submit complaints to the Commission or how they can do so.[30] This is a considerable problem and the Commission should take proactive steps to improve consumer awareness. An immediate step would be to place a link directly to the on-line complaint form more prominently on the FCC website, where currently users have to first click on the consumer link, which takes them to the 'Consumer Bureau' page, where they can then

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[26] *See Comcast Acceptable Use Policy*; Appendix 4, Exhibit B.
[27] *See* Livingood, Jason, *Comcast Data Usage Meter Launches*; http://blog.comcast.com/2009/12/comcast-data-usage-meter-launches.html.
[28] *See* Letter from Kathryn A. Zachem, Vice President, Regulatory Affairs, Comcast Corp., to Dana Shaffer, Chief, Wireline Competition Bureau, and Matthew Berry, Gen. Counsel, FCC (Jan. 30, 2009); http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6520194593.
[29] *Id.,* p. 7–9.
[30] *See* ¶ 51, *Customer Information and Disclosure Truth-in-Billing and Billing Format IP-Enabled Services,* CG Docket No. 09-158; CC Docket 98-170; WC Docket No. 04-36, Notice of Inquiry, FCC 09-68 (rel. 28,2009) ("Notice").

submit a complaint. Further, the FCC should require providers to include on their bills information how to contact the Commission to file a complaint. In addition, services provider should be mandated to include FCC complaint information on their websites where customer service information is located as well as disclose it to consumers that contact a provider's customer service center by phone or e-mail.

Also, the FCC should consider allowing consumers to append performance test results to the complaint form from measurement tools and to report discrepancies between the actual performance and advertised. As NAF provides below, active measurement tools can empower consumers to test the actual performance capabilities of their broadband connection as well as provide diagnostic tools to determine problems with a broadband connection or why an application is not working. The Commission could even direct consumers on the form to best-practice measurement and diagnostic tools.

In addition, it is critical the FCC make public as much of the complaint data as possible. The current quarterly reports on "Informal Consumer Inquiries and Complaints" are far too limited.[31] The public is only provided with summary statistics on the number of complaints and the top "subjects" for consumer inquiries and complaints. There is no indication of how many complaints and the subject of those complaints for each service provider, although consumers can indicate that on the complaint form. If the complaint process is to have any effect on improving broadband competition and empowering consumers, then the FCC must make publicly available data the number of complaints and the subject of those complaints for each service provider. Such publicly available information could be utilized by any number of consumer groups, publications, or websites to establish consumer comparisons of service providers – giving service provides a clear incentive to improve their customer service. Further, to promote robust analysis of the data, the data should be released in an open format such as .CSV, .ODF, or .TXT, rather than just in PDF form.

III. MEASUREMENT OF FIXED SERVICES

Measuring, collecting, and analyzing data on network performance and traffic has been a hallmark of the Internet. NSFNET, which served as the precursor backbone to the commercial Internet, collected and made publicly available performance statistics from 1988 to 1995. Each of the thirteen backbone nodes (Nodal Switching Subsystems) on NSFNET provided packet, routing control, and statistics gathering (for network traffic information) for the network."[32] NSFNET performance statistics were collected, processed, stored, and publicly reported by the Merit Network.[33] NSFNET collected three classes of network statistics, interface statistics; packet categorization; and intermodal delays.[34] However, when the backbone was

[31] *See* FCC Quarterly Inquiries and Complaints Reports, http://www.fcc.gov/cgb/quarter/welcome.html.
[32] *See* Merit's History: The NSFNET Backbone Project, 1987-1995. http://www.livinginternet.com/doc/merit.edu/partnership.html. *See also* Claffy, Kimberly C., Braun, Hans-Werner, and Polyzos, George C., *Tracking Long-term Growth of the NSFNET;* Available at http://cseweb.ucsd.edu/groups/csl/pubs/journal/cacm.94.ps. *For a list of metrics see* http://www.cc.gatech.edu/gvu/stats/NSF/merit.html.
[33] *See* Braun, Hans-Werner and Claffy, K. *post-NSFNET statistics collection*, 1 – 2; Available at http://www.caida.org/publications/papers/1995/pnsc/postns.pdf.
[34] *See* Claffy et al *Tracking Long-term Growth of the NSFNET.*

decommissioned in the mid-1990s to privatize the network infrastructure, integration of data collection into network equipment and access to resulting data ceased. Since that time, access to data on Internet traffic, topology, routing, and security have diminished and Internet researchers have struggled to conduct valid and reproducible scientific experiments under increasingly restrictive constraints.[35] This in turn, has substantially reduced the transparency on the Internet that was an essential component of its success and has limited collaboration and the diffusion of best practices across the Internet. Innovation in networking technology is overwhelming shaped by service providers, whose incentives are often more aligned with technological improvements that bring in additional revenues rather than more efficiently or effectively improve the performance of networks. At the same time, policymakers are almost entirely dependent upon the service providers for data on the workings of the Internet as a means to determine appropriate policies.

What is needed is a sustained effort to bring greater transparency and promote open, data collection on broadband services and the Internet in the U.S. Already, there are data collection efforts underway to improve transparency to the Internet, empower consumers, and promote research and innovation projects such as Measurement Lab[36] and BroadbandCensus.com[37]. In addition, researchers have developed proposals such as the COMMONS project to provide access to performance and traffic data on the Internet networks.[38] The FCC can build-upon these efforts and develop policies to improve and enlarge its own data collection efforts. Key to this effort will be utilizing many testing methods and measurement tools toward maximizing the openness and transparency of broadband measurements—including making data publicly available to allow for independent verification and analysis.

We encourage the Commission to think broadly about measurements and data collection, promote efforts that will empower consumers and the FCC to assess the capabilities of broadband services, and create viable sources for data on Internet traffic and network performance for researchers and policymakers. NAF proposes a comprehensive approach to measuring broadband, encompassing both passive and active measurement processes.

Physical Infrastructure Description

Figure 2 below depicts the network segments providing connectivity from an end-user to the content hosted on the public Internet represented by the numbers in yellow circles.

1. **Public Internet:** Content on the Public Internet is hosted by multiple service providers, content providers, and other entities in a geographically diverse (worldwide) manner.

2. **Internet Gateway/Border Router:** The Internet Gateway or Border Router is the closest peering point between the Internet backbone and the internal middle mile network of an Internet Service Provider (ISP) and/or Internet Exchange Points (IXP).

[35] *See The COMMONS Initiative*; Appendix 1, p. 5.
[36] http://www.measurementlab.net.
[37] http://www.broadbandcensus.com.
[38] *See The COMMONS Initiative*; Appendix 1, p. 5.

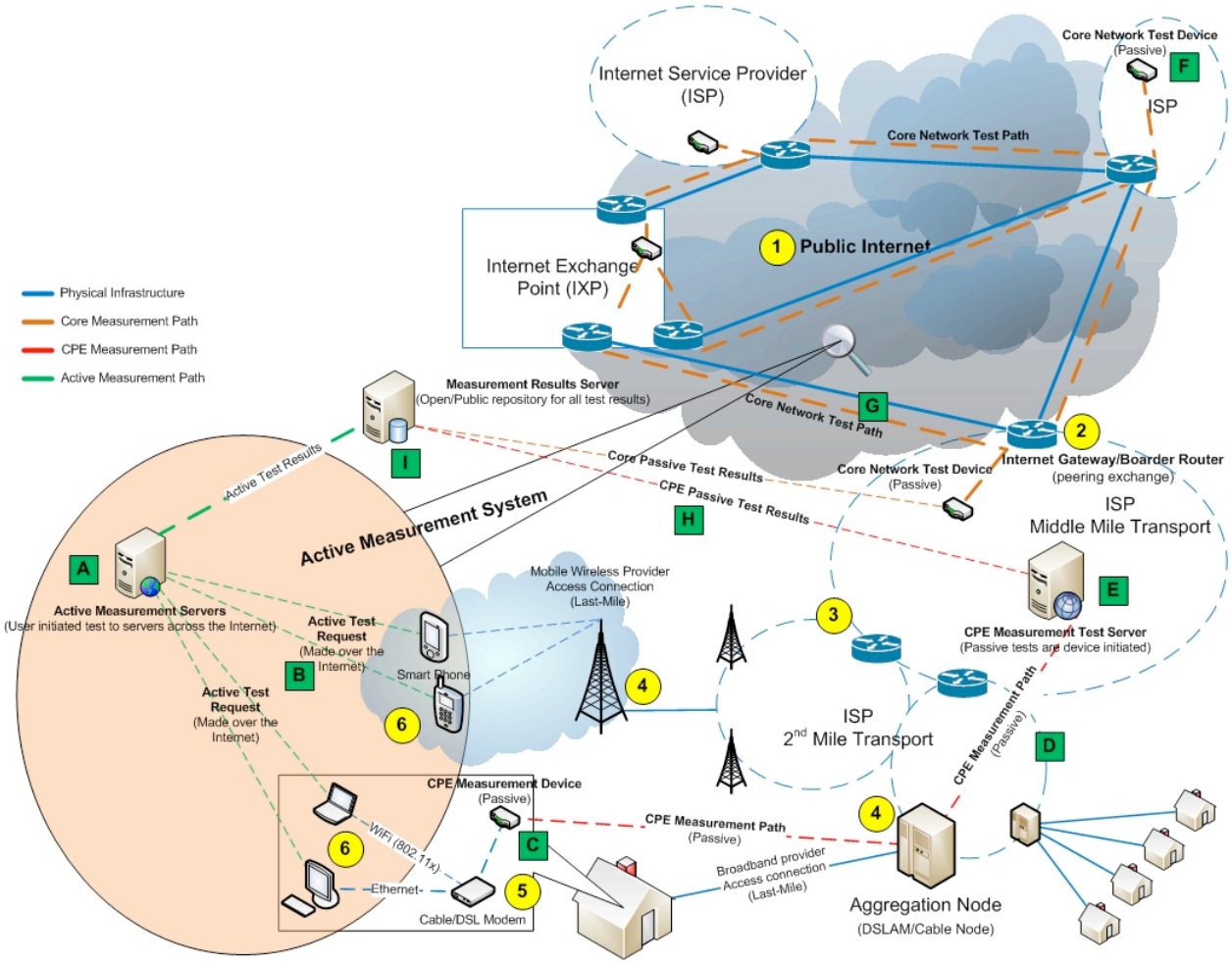
3. **Link between Middle Mile and 2nd Mile network:** The connection between the middle mile network and a 2nd mile network is often provider managed.

4. **Aggregation Node (Link between 2nd Mile and Last Mile network):** The 2nd mile network terminates at an aggregation node, such as a cable node, DSLAM, satellite, fixed cellular tower, etc., the first aggregation point from the provider's 2nd mile network to the start of the last mile network.

5. **Modem:** The Customer Premise Equipment (CPE) is the last connection point to the managed network that is often managed by the provider. Examples of a CPE include DSL modem, cable modem, satellite modem, mobile cellular device or Optical Network Terminal.

6. **Consumer Devices:** Consumer devices, such as desktop/laptop computers or cellular phones connect to the modem through an internal wired or wireless home network connection. Hardware and software used to access and process content are usually managed by the consumer.

Figure 2: Measuring Broadband Services and the Internet



Proposed Measurement System

The above figure depicts our proposed system for measuring network segments and use from the end-user and points within public Internet indicated by the letters in green squares. The numbered and lettered items below correlate with those items in the figure above.

A. **Active Measurement Servers:** Active Measurement Servers process user-initiated tests and are located within provider's Middle Mile network and at Internet Exchange Points to provide the best possible connection to Internet Gateway/Border Routers (circle 2).
B. **Active Measurement Test Request:** Users can, on computers and other consumer devices (circle 6), request a test of their network by Active Measurement Servers located within their provider's Middle Mile networks or within other provider's Middle Mile networks over the Internet.
C. **CPE Measurement Device:** Managed devices located behind Last Mile Customer Premise Equipment (CPE) that request passive (not initiated by a user) network measurements of the providers network from the CPE Measurement Server (E).
D. **CPE Measurement Path:** A CPE Measurement Test connects to a CPE Measurement Server (E) after flowing from the Modem (circle 5), through the Aggregation Node (circle 4), and the 2nd Mile network into the Middle Mile (circle 3).
E. **CPE Measurement Server:** The CPE Measurement Server is the end point of the CPE Measurement Path and where testing tools and results are initially stored. The CPE Measurement server determines which tests, and at what frequency, the CPE Measurement Device initiates requests.
F. **Core Network Test Device:** Core Network Test Devices are located within provider's Middle Mile networks and Internet Exchange Points with best available connections to Internet Gateway/Border Routers (circle 2). They take perform passive (not initiated by a user) measurements of Middle Mile to Middle Mile network states. The testing tools on Core Network Test Devices will be able to both initiate a test and respond to a request from another Core Network Test Device. Results are then relayed directly to the Measurement Results Server (I).
G. **Core Network Measurement Path:** The test path taken by Core Network Test Device's will be across primary peering points between ISP's and IXP's networks.
H. **Passive Test Results:** Results from the CPE Measurement Devices (C) and Core Network Test Devices (F) are sent to a central Measurement Results Server (I).
I. **Measurement Results Server:** All measurements from both passive [(CPE (C) and Core devices (F)] and active test (A) are stored on a Measurement Results Server, providing a central repository. All results are stored in a standard open format and available to the public for review analysis, and to researchers for independent verification of the data.

Active vs. Passive Measurement

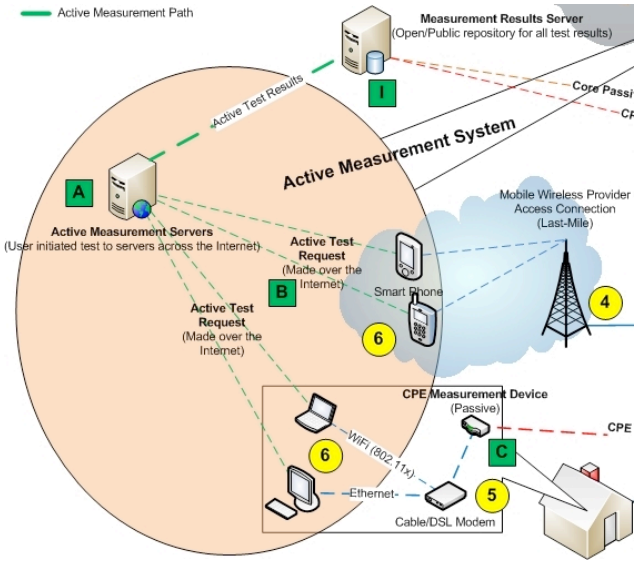
As the Commission considers methods for measuring broadband services, it is important to make a distinction between user-initiated "active" and "passive" measurements. For purposes of NAF's proposals and the above diagram we are defining "active" measurements as those

initiated by an end-user, such as a broadband subscriber, and "passive" measurements as non-user initiated. This definition slightly differs from the research community's categorizations that recognize a passive test as one that observes the behavior of test object during normal operation and does not initiate the activity or use its own data as an input into the test; and defines an active test as one that introduces data from a transmission and analyzes the resulting network performance. While the definition of active and passive test used in this document is not identical to that often used in the research, there are many instances where tests can fit under both definitions.

Examples of active measurements include basic speedtest tools[39] to more sophisticated tools such as those found on the Measurement Lab platform.[40] Active measurements challenges include: (1) deployment to insure low impact on the infrastructure; (2) prevention of use of tools for Distributed Denial of Service attacks; (3) accountability of measurement source; (4) analysis of bias due to self-selection of sources (by volunteers); and, (5) validation of the integrity of resulting data.[41] Client-side automatically initiated passive measurement infrastructures are like those integrated into the NSFNET backbone described above. Hardware and software integrated into the networking technology or connected "boxes" collect and track traffic and performance data over a network over time. Among the key challenges of passive measurements is protecting privacy as well as ensuring the system and resulted data is not manipulated by a particular operator or application.

1. Active Measurement (End-User Initiated Tests)

Figure 3: Active Measurement System



[39] Examples include http://www.speedtest.net/, http://www.speakeasy.net/speedtest/, and http://www.dslreports.com/speedtest?flash=1.
[40] http://www.measurementlab.net/measurement-lab-tools.
[41] *See The COMMONS Initiative*; Appendix 1.

Active measurements are initiated by an end-user, such as a broadband subscriber, and measure the network during a specific task (square B). Examples include basic speedtest tests such as those provided by websites such as Speedtest.net[42] and others, but they can also include measuring more sophisticated performance and diagnostic tests to determining if an ISP is throttling or blocking specific applications.[43] The possible uses of active measurement systems include: 1) consumers testing the performance capabilities of their broadband connection; 2) diagnostic tools to determine problems with a broadband connection or why an application is not working; 3) tools for consumers and regulators to compare actual broadband performance versus advertised; and, 4) experimentation and data collection for Internet researchers and regulators.

A sample architecture of an active measurement system is provided above in Figure 3. Measurement servers process the user initiated tests and are located within provider's Middle Mile network and Internet Exchange points (square A). Ideally for most situations, servers are located as close as possible to a provider's Gateway/Border Router to accurately measure performance metrics and networking characteristics on the last-mile connection. (However, active measurement tools may also seek to examine the entire path of a transmission along multiple networks.) Broadband users then on their consumer devices such as PCs, laptops, or smartphones can run a test from the measurement server, which then processes the test, collects the data, and provides the user with results.

An example of a measurement system for consumers and researchers is Measurement Lab (M-Lab).[44] It is an open, distributed server platform for researchers to deploy Internet measurement tools. The goal of M-Lab is to advance network research and empower the public with useful information about their broadband connections.[45] M-Lab differs from a number of other active measurement efforts by providing: 1) an open platform that assists scientific research by provisioning widely-distributed servers and ample connectivity for researchers' use; 2) server-side tools that are open-sourced software that allows third-parties to develop their own client-side measurement software; and, 3) open and publicly accessible data about Internet measurements for the research community, policymakers, and the public.[46]

As the Commission considers utilizing testing and measurements to improve consumer information and transparency on broadband services and the Internet, NAF believes openness and publicly available "raw" data is key to maximizing the benefits of active measurements for consumers, researchers, policymakers, innovators, and even service providers. The extent to which active measurements can be utilized for assessing the performance of a broadband service and collecting accurate data is dependent upon the validity of the measurement tool. Users, researchers, policymakers and service providers must be able to verify the accuracy of the measurement. Open sourcing allows for all parties to truly understand the test methodology of a

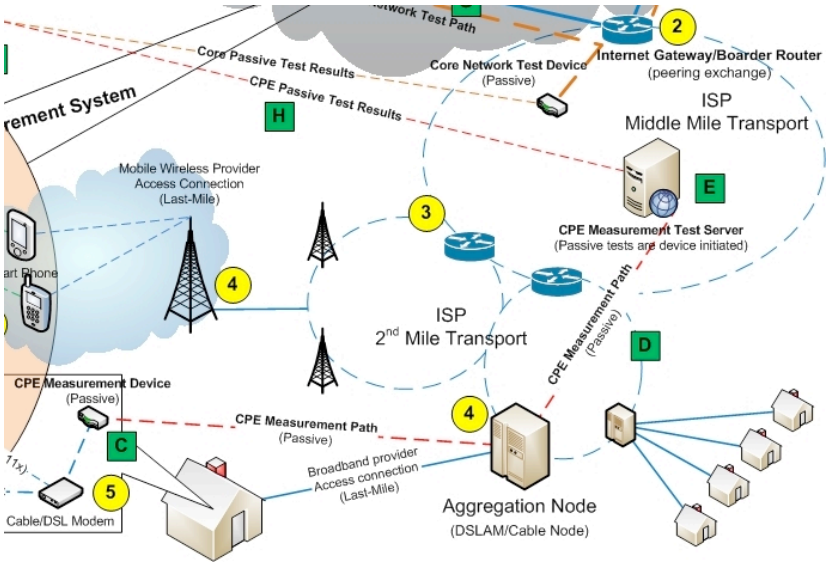
[42] *See* http://www.speedtest.net/. *See also* http://www.speakeasy.net/speedtest/ and http://www.dslreports.com/speedtest?flash=1.
[43] http://www.measurementlab.net/measurement-lab-tools
[44] Measurement Lab was founded by the NAF, the PlanetLab Consortium, Google Inc. and academic researchers. *See* http://www.measurementlab.net.
[45] *See* Appendix 5 Exhibits A and B.
[46] Data from two of M-Lab's tools is publicly available on via Amazon Web Services, allowing anyone to make use of this information without restriction, under a "no rights reserved" Creative Commons Zero waiver. *See* http://www.measurementlab.net/news/2009/dec/10/calling-all-researchers-m-lab-data-now-available-amazon-ec2

particular measurement tool and encourages continued refinement and improvement. As NAF proposed above, the FCC could allow consumers to submit active measurement results to the Commission as part of an improved consumer complaint process. Unlike closed, proprietary tools, open source tool would allow all affected parties including service providers to examine the code and assess the validity of the measurement instrument.

The usefulness of measurements of broadband connections and the Internet to improve research, innovation, and public policy is also substantially tied to open and accessible data. For many active measurement tools or services, data collected from individual tests is often unavailable to the public, researchers, or policymakers (or is available only for a fees). This substantially limits the usefulness of the data. It is critical that any data collected through an FCC-led effort, be open and publicly available to encourage robust research, analysis and independent verification.

2. Passive Measurement (Customer Panel Devices)

Figure 4: CPE Measurement System



Similar to user-initiated measurements, passive measurements could be utilized to test last-mile connections without initiation from an end-user. These measurement projects draw on the inspiration of SETI@Home to develop passive client-based measurement software and/or hardware to collect user data.[47] Users voluntarily install software or some type of CPE measurement device (square C) that passively runs tests under controlled conditions and report them back to measurement server (square E.)

[47] *See* Anderson, David P., Cobb, Jeff, Korpela, Eric, Lebotfsky, Matt, and Werthimer, Dan; *SETI@home: An Experiment in Public Resource Computing* 45 COMM. OF THE ACM 56, 56 (2002) (explaining that Search for Extraterrestrial Intelligence at Home (SETI@Home) is a project in which "[m]illions of computer owners worldwide contribute computer time to the search for extraterrestrial intelligence, performing the largest computation ever.").

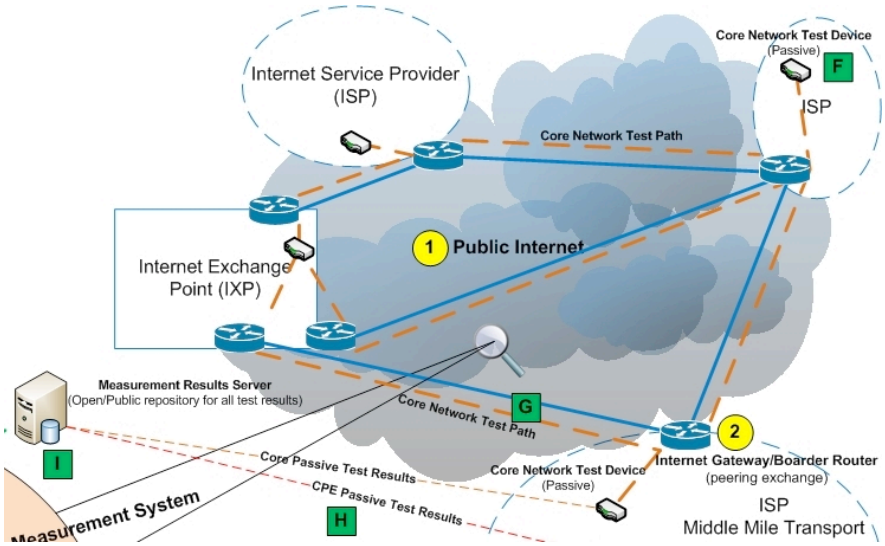
An example of this is SamKnows "Sandbox," a configured monitoring devices in homes across the UK running tests and collecting performance data 24 hours a day, 7 days a week, 365 days a year.[48] The benefits of this approach are that measurements can be collected in a consistent manner, over time and as a representative sample. In 2008, OFCOM, the United Kingdom's telecommunications regulator, partnered with SamKnows to carry out a comprehensive study of broadband provider performance.[49] OFCOMselected SamKnows as its technical partner in the project, and SamKnows provided the in-home hardware devices, methodology and funding the deployment. OFCOM then commissioned a market research firm to recruit and manage a representative panel of UK broadband users.[50]

NAF believes a similar approach would be beneficial to FCC data collection and provide policymakers important data for assessing and monitoring the state of broadband and the Internet in the U.S. Such an effort should include a representative panel of U.S. broadband users that includes under-represented populations, and subscribers from as many broadband providers as possible. Beyond a single report, the FCC could consider utilizing this panel approach to consistently measure broadband. Results from the panel would be a useful addendum to the Commission's annual report on the availability of high-speed and advanced telecommunications services.[51] If the Commission considers utilizing representative panels, it is once again essential that it focus on maximizing openness and transparency in the measurement tools and processes and make these data publicly available to allow for independent verification and robust research and analysis.

[48] *See* Samknows Sandbox at http://www.samknows.com/broadband/samknows-labs.php?page=samknows-labs-samknows-sandbox.
[49] *See* Ofcom Benchmark at http://www.samknows.com/broadband/performance.php?page=performance-ofcom-and-samknows.
[50] *Id.*
[51] *See Inquiry Concerning the Deployment of Advanced Telecommunications Capabilities to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Acto of 1996: Fifth Report*; GN Docket No. 09-45, FCC 08-88 (rel June 12, 2008).

3. **Passive Middle-Mile and Backbone Measurement**

Figure 5: Core Network Measurement System



Since the privatization of the NSFNET backbone, researchers and policymakers have limited access to fundamental performance and traffic data on the middle-mile and backbone portions of the Internet. As the Commission examines complex issues of network congestion and network management, it is entirely dependent on analysis of traffic and usage data from service providers. Data that is publicly accessible, and independently verifiable would support independent analysis of actual Internet traffic, and inform salient debates on technical, economic, policy, privacy, and social issues relating to the Internet.

Among the areas of greatest need is access to fundamental performance and traffic data from peering and IXPs. The above detail from Figure 2 illustrates a system of passive devices (square F) placed immediately within provider's and Internet exchange point's networks as close to the Internet Gateway/Border routers (circle 2) as possible. These devices would be taking both passive and active tests from core paths between ISP's and IXP's (square G). As an optical fabric, the measurement devices could support direct measurement of wavelengths or provide SNMP counters as supported in the attached equipment.[52] Results from all tests could be stored and available to the public for review, analysis, and verification on a results server (square I).

Most ISPs, middle-mile, and backbone providers already collect information on traffic flows and volume.[53] However, there is limited, if any, public disclosure of the raw traffic data. Reports and analysis are entirely conducted or directed by the provider. Policymaking and innovation, would substantially benefit from requirements for these providers to disclose fundamental information Organizations such as the Cooperative Association for Internet Data Analysis (CAIDA) have attempted to fill this void, through placing passive monitoring equipment at several different data types at geographically and topologically diverse

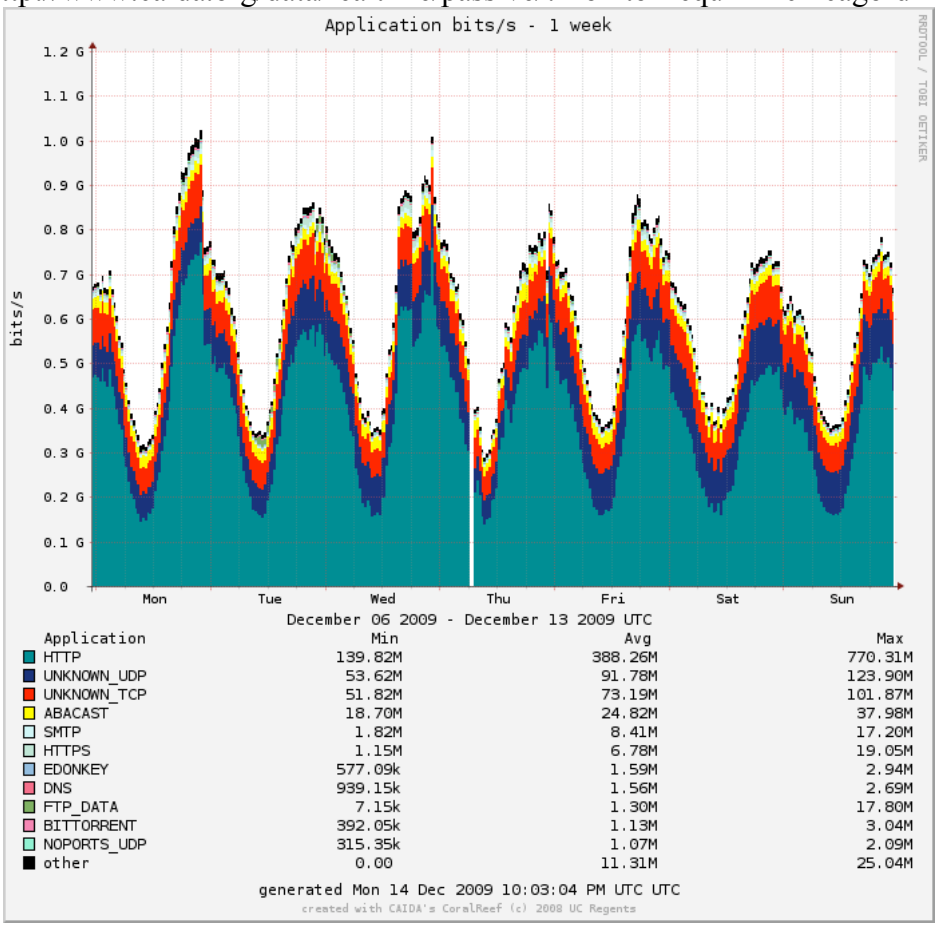
[52] *See The COMMONS Initiative*; Appendix 1.

[53] *See for example* "Integrated Routing and Traffic Analysis and Modeling for Internet Peering," Packet Design, Technical Brief, http://www.fvc.com/FVC/fvcweb/Files/IntegratedIPRoutingAndTrafficAnalysis.pdf.

locations, and makes this data available to the research community to the extent possible while preserving the privacy of individuals and organizations who donate data or network access.[54] But, the number of sites is inherently limited as research organizations such as CAIDA do not have access to the vast majority of peering reports.

Researchers, competing providers, and consumers alike benefit from more transparency in the core of the Internet. Along with tests that determine network connection states (e.g. capacity, congestion, latency, jitter, throughput, prioritization), tests that identify use trends should be conducted. Researchers at CAIDA have implemented both and active and passive monitoring system allowing the public to view near real-time graphs of network usage trends (Figure 6). Policymakers, researchers, ISPs, network device makers, and customers alike need independent analysis of the health of the Internet pathways and the ability to go as deep as needed into the data to promote a thriving future Internet.

Figure 6: CAIDA Chicago Passive Monitor
(http://www.caida.org/data/realtime/passive/?monitor=equinix-chicago-dirA)



Such an effort should further encourage greater access for academic and research organizations to access a greater number of IXPs for passive monitoring and a collection of measurements that provide an indication of overall backbone health (e.g., capacity, congestion,

[54] http://www.caida.org/data/passive/.

actual use, and throughput) and utilization trends. This effort would provide more information from the inside rather than the basic information available from outside such as Keynote's Internet Health Report[57] or AnalogX's Internet Traffic Report[58] both of which are limited to round-trip travel time using the ping utility.

IV. CONCLUSION

The current rules to ensure consumers' access to relevant information about the communication services they are purchasing are grossly insufficient. Service providers overpromise on the capabilities of their service and routinely fail to disclose limitations to services and hidden fees – leading to consumer confusion and frustration. Substantial changes to the Commission's existing rules are necessary to remedy these problems. Commission rules should require providers to disclose vital information on the performance capabilities, price, and terms of the service offering before consumers purchase a service. Similarly, existing customers should receive advanced and explicit notification on any changes to the technical capabilities, terms of service or use, privacy policy, network, management practices, and any other changes to the service.

In addition, policymakers, researchers, and innovators have access to little information about the workings of the Internet. What is needed is a sustained effort to bring greater transparency regarding broadband services and the Internet in the U.S. The FCC can build upon these efforts and develop policies to improve and enlarge its own data collection efforts. Key to this effort will be utilizing many testing methods and measurement tools to maximize the openness and transparency of broadband measurements and ensure that data is publicly available and to allow for independent verification and robust analysis. Taken together, these efforts will bring much-needed transparency to the broadband marketplace, empower consumers, spur research and innovation, and improve public policy.

Respectfully submitted,
/s/

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December 14, 2009

[57] http://www.internetpulse.net/.
[58] http://www.internettrafficreport.com/.

New America Foundation's
OPEN TECHNOLOGY INITIATIVE

March 11, 2011

Marlene Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: Notice of *Ex Parte* Presentation
CG Docket No. 09-158 (Consumer Information and Disclosure)
WT Docket No. 05-194 (Early Termination Fees)
CC Docket No. 98-170 (Truth-in-Billing and Billing Format)

Dear Ms. Dortch:

On March 10, 2011, the undersigned, of New America Foundation's Open Technology Initiative (NAF), attended a meeting with Mark Stone; Kurt Schroeder, Rebecca Hirselj, William Freedman, John B. Adams, Lynn Ratnavale, and Arthur Scrutchins, all of Consumer and Governmental Affairs Bureau; Joel Taubenblatt of the Wireless Telecommunications Bureau; and Matthew Warner of the Wireline Competition Bureau.

During the meeting, I presented NAF's views on a number of issues raised in the above-captioned dockets, including "bill shock" alerts, truth-in-billing and truth-in labeling requirements, and early termination fees ("ETFs").' As part of that presentation, and in response to questions from the Commission attendees, I focused particularly on NAF's "truth-in-broadband" label presented in comments and other submissions filed by NAF and jointly with other organizations in the Consumer Information and Disclosure (CG Docket No. 09-158) and A National Broadband Plan for our Future (GN Docket 09-51) proceedings and also attached hereto, which provides an example of how essential information could be presented to consumers.

Throughout the discussion, I reiterated NAF's position that the Commission should adopt standardized disclosure requirements and other baseline consumer protections across all communication and broadband services (both wired and wireless), with rules made applicable to materials provided at point-of-sale, on websites, on bills, and in other interactions with customers. Such measures would ensure that wireless and wireline communications companies provide their customers with more reliable information about service prices, terms and conditions, performance, limitations, contract length, and billing procedures.

Commission oversight in disclosure should entail at minimum the adoption of standardized performance metrics, pricing information, and presentation formats that allow end-users to compare competing service offerings on an apples to apples basis among different service plans and providers. I further stressed the importance of the Commission to lean towards more information disclosure than less. Though consumers are likely to have different levels of technical literacy or understanding, more

in-depth information will be invaluable to organizations such as Consumer Reports and other similar entities to analyze and provide consumer's with tools and resources to determine what service will most fit their needs and pocketbooks.

With respect to NAF's "truth-in-broadband" label (hereinafter referred to as the "label"), I discussed the various components of the label and in particular the use of a guaranteed minimum speed as a critical point of consumer information and disclosure. Similar to minimum performance guarantees for uptime and latency standard in service level agreements (SLA's) for commercial business broadband users, the guaranteed minimum speed would be determined by the broadband provider as a floor for what consumers would receive from the service. It would provide an incentive for providers to better reflect the capacity and limitations of their broadband technology or network than the current industry standard of "up to" speeds. In particular, for broadband technologies and networks that rely on high contention ratios in relation to network capacity as a result of network architecture or business decisions, the guaranteed minimum would serve as a way for consumers to better assess this limitation without necessarily understanding for example the technological differences between cable modem, DSL, FTTH, WiMAX, HSPA+, LTE and other broadband technologies that can impact the actual performance of a broadband service.

I further noted the need for consumers and the Commission to be able to verify that a service provider is meeting its guaranteed minimum speed. The verification process would require the use of broadband measurement tools such as Network Diagnostic Tool (NDT), hosted by Measurement Lab and utilized by the Commission for its Consumer Broadband Test, that would allow consumers to verify the actual performance of a broadband service. NAF has filed extensive comments on broadband measurement in CG Docket No. 09-158 and GN Docket 09-51 proceedings and also attached hereto.

I also stressed the importance of the label including accurate and comprehensive pricing information, any and all additional fees associated with the service including early termination fees, and any service limits such as bandwidth or usage caps on the service. Service limit disclosures should also include any traffic management techniques utilized by the network provider that would affect the bandwidth/speed available to a user's connection once they have reached a certain usage limit or any other discriminatory treatment of certain kinds of network traffic, applications, and content. These disclosures can be brief on any standardized format but should direct consumers to resources with more in-depth information.

With respect to Bill Shock, I reiterated NAF's support for strong bill shock protections and mandatory alerts set forth in the comments and reply comments jointly filed with the Center for Media Justice, Consumer Action, Consumer Federation of America, Consumers Union, Free Press, Media Access Project, National Consumers League, and National Hispanic Media Coalition in in the Consumer Information and Disclosure (CG Docket No. 09-158) and Empowering Consumers to Avoid Bill Shock (CG Docket No. 10-207) proceedings. I also added the need for similar bill shock alerts for any communication and broadband service including wired that utilize metered billing or impose usage caps. Consumers should be made aware if they are about to reach a usage cap, if they have exceeded the cap and any fees associated with exceeding the cap, as well as any 'throttling' of their traffic that may occur.

Finally, I noted NAF's opposition to ETFs that have no basis in carrier’s costs, and serve only to lock-in customers and generate revenues for wireless and wireline broadband service bundles. Programs that fairly subsidize devices and service are acceptable, but companies imposing ETFs should be required to disclose fully and openly the amount, terms, and prorated amount (if any) of such fees,

along with the terms of other potential add-ons, restocking, or other fees that could increase the total cost of service incurred by subscribers. Moreover, ETF's should also be clearly disclosed on a customer's monthly bill along with the remaining term length of their contract.

NAF submits this letter to the Secretary's office today pursuant to Section 1.1206(b) of the Commission's rules, 47 C.F.R. §1.1206(b). Please contact the undersigned should you have any questions regarding this submission.

Respectfully submitted,

/s/
Benjamin Lennett

Senior Policy Analyst
Open Technology Initiative
New America Foundation

cc: Mark Stone
Kurt Schroeder
Rebecca Hirselj
John B. Adams
William Freedman
Arthur D. Scrutchins
Joel Taubenblatt
Matthew Warner
Lynn Ratnavale

Consumers, Transparency, and the Open Internet

Testimony of

Sascha D. Meinrath

Director, Open Technology Initiative

New America Foundation

before the

Federal Communications Commission

January 19, 2010

I wanted to begin by thanking the Commission [Federal Communications Commission, hereafter FCC] for granting me the opportunity to discuss the transparency and data collection efforts I and others have been engaged in – more recently as a part of the MeasurementLab.net project as well as other a number of other efforts over the preceding years and decades.

Today, I provide expert testimony through my experiences with these efforts and as Director of the New America Foundation's Open Technology Initiative (OTI). OTI formulates policy and regulatory reforms that promotes affordable, universal, and ubiquitous communications networks and provides in-depth, objective research, analysis, and findings for policy decision-makers and the general public.

My testimony will bridge the key facets at stake regarding Consumers, Transparency, and the Open Internet and my discussion is supported by our December 14, 2009 comments on Public Notice #24. This 115-page filing contains extensive technological documentation of both real-world options for collecting meaningful information, provides context based on available research literature, and how problems raised by some commentors have already been addressed.

As we enter the second decade of the 21st Century, I am utterly astounded by the level of ignorance presented to the FCC concerning the history of data reporting about the Internet.

The Internet was, first and foremost, a research project. As a research initiative, data-collection and transparency have been at the heart of this endeavor since its inception.

Many of these statements made, that issues are either "too complex" or "technologically infeasible" to address, run contrary to established standard practices that have been around for years, if not decades. The Internet is not a Schrödinger's cat of data transmission, or a network grown beyond opportunities of reasonable or manageable data collection. Let me be clear – almost all of the useful information that we would like to see made public *is already being collected by system administrators and ISPs.*

For the research and scientific community, the problem is not how to collect information that would be useful to consumers, but why successful public data collection practices stopped in the first place?

This data collection dilemma, this lack of transparency of vital network data, is not a recent concern. On January 9, 1995 – exactly 15 years ago this month, Merit, which ran NSFnet, issued the following statement raising concerns about the changes in data collection as NSFnet was privatized:

> "NSFNET performance statistics have been collected, processed, stored, and reported by the Merit Network since 1988. During December 1994, the numbers contained in Merit's statistical reports began to decrease, as NSFNET traffic began to migrate to the new NSF network architecture... Once the new

> architecture is in place, Merit will be unable to collect the data needed to continue these traffic-based reports. The reports will be discontinued by spring 1995."

Year after year since this transgression, we have experienced the steady removal of useful information from the public.

Data-collection requirements mandated under NSFnet eroded to voluntary adherence to the prior norms of data collection and transparency with disastrous consequences.

When history explains how the United States went from #1 in broadband service in the early 1990s to our current appalling international standing, a central theme will be this willful ignorance, this dearth of publically available data that has lead to a series of unbelievably shortsighted policy actions and inactions. This loss of useful broadband information has systematically disempowered broadband users and allowed for the creation of increasingly dysfunctional markets.

But I am not testifying to project certain failures but to offer solutions. The FCC has both an opportunity and a responsibility to act to rectify these problems.

I will focus the remainder of my time on two simple solutions to the problems I have described: The Open Technology Initiative's Broadband Truth-in-Labeling proposal and the MeasurementLab.net initiative.

When OTI proposed a Broadband Truth-in-Labeling model, a "broadband nutrition label", we were drawing from both the notion that consumers want meaningful information and that they have an increasingly diverse array of needs from their broadband connections.

Our Broadband Truth-in-Labeling proposal would ensure that specific information be made available to consumers (for example, upload and download speed, uptime, latency, and pricing) and that private industry had the opportunity to decide what level of service they would guarantee to their customers.

A similar level of disclosure is currently offered by most Internet service providers to business class customers and include service level agreements and guarantees that enable businesses to compare and contrast among multiple service offerings. We want to mandate these provisions and ensure service transparency to all classes of consumers.

The FCC has the ability to implement these disclosures immediately, but is under substantial pressure to avoid meaningful information to consumers and adopt a "5-star" rating system that could utterly gut the intent of OTI's proposal.

Consumers need meaningful information that differentiates among service providers and the FCC has a responsibility to create clear disclosure rules that ensure consumer have access to fundamental information about their broadband service offerings for both wireline and wireless networks.

A 5-star rating could be the information gateway, but only if the FCC also includes a clear mandate that the useful information underpinning this rating system must also be disclosed and easily accessible to consumers such as the OTI Broadband Truth-in-Labeling model below.

ExampleCom Ultra 15 Mbps Broadband Truth-in-Labeling	
Advertised Speed	15 Mbps downstream/2 Mbps upstream
Service Guarantees Services are measured from and to the border router.	
Minimum Speed at Border Router	8Mbps downstream /384Kbps upstream
Minimum Reliability/Uptime	96%
Maximum Round-trip Latency (Delay) to Border Router	50ms
Service Guarantee Terms	Daily service credit upon request for any outages or extended periods of under-delivery of service
Prices	$44.99 monthly service $19.99 monthly for the first six months on promotion
Service Limits (List all traffic management techniques)	• Exceeding 100GB calendar week considered excessive use, subject to disconnect penalties, see http://www.examplecom.invalid/excessive • Traffic by heavy users in congested areas is artificially slowed, see http://www.examplecom.invalid/shaping
Other Fees (ISPs cannot charge if not listed)	$3 monthly modem rental fee $59.99 installation fee $19 outlet installation $150 early termination during promotion period $2 account change fee $35 service call fee unless $3 monthly inside wiring maintenance plan is in force Sales taxes and franchise fees, vary by location
Contract Term	At will, customer may cancel at anytime after first six months. During the first six months, a cancellation results in a $150 fee.
Service Technology	DOCSIS 1.1 / 2.0 HFC
Legal and Privacy Policies	http://www.examplecom.invalid/legal

Consumers also need to be able to test and collect information about their data connection. The FCC should lead an extensive effort to measure and collect fundamental data on broadband service capabilities and Internet performance and traffic statistics. This effort should contain both national comparative information as well as a level of granularity that allows customers to compare offerings within their neighborhood.

Within this context the Open Technology Initiative, a global coalition of researchers from

PlanetLab, and Google have pioneered a unique broadband measurement platform: Measurement Lab.

The MeasurementLab.net initiative (or M-Lab for short) is an open, distributed server platform for researchers to deploy Internet measurement tools. M-Lab's goals are to advance network research and empower the public with useful information about their broadband connections.

Every broadband measurement tool on M-Lab is entirely open source – and we encourage anyone with concerns regarding the objectivity of our tests to examine the code and let us know if you find any places for improvement.

Further, M-Lab is open to participation from all quarters – and we request anyone with a tool that they believe would improve the system to contact us.

All data collected as a part of the M-Lab project is made publicly available under a Creative Commons Zero license – so anyone who wants to crunch these numbers can do so.

At its heart, M-Lab is an open, independent, and transparent process for:

1. Developing a suite of Internet measurement tools;
2. Collecting data in an objective manner; and,
3. Ensuring that this useful information is made publicly available in a timely manner.

The FCC has an opportunity to leverage these assets to create the tools and information resources needed to empower consumers.

I respectfully submit a three-part conclusion:

- First, systematic data-collection efforts (and the public release of these data) have been a part of the Internet since its inception and only ceased in the mid-1990s when NSFnet was privatized.
- Second, the best metrics for the data that need to be collected and the processes for collecting this information have already been identified and a prototype system set up.
- And third, the technological and scientific underpinnings are already established, thus this is not a concern of technology but policy, an issue of clear leadership at the FCC.

The FCC has an opportunity to establish clear goals and timelines for establishing broadband measurement and collection processes as well as a responsibility to disseminate this information publicly. With forthright leadership, 2010 should be the year that consumers are finally empowered with meaningful broadband information and

the FCC started turning broadband around in the U.S. Thank you.